

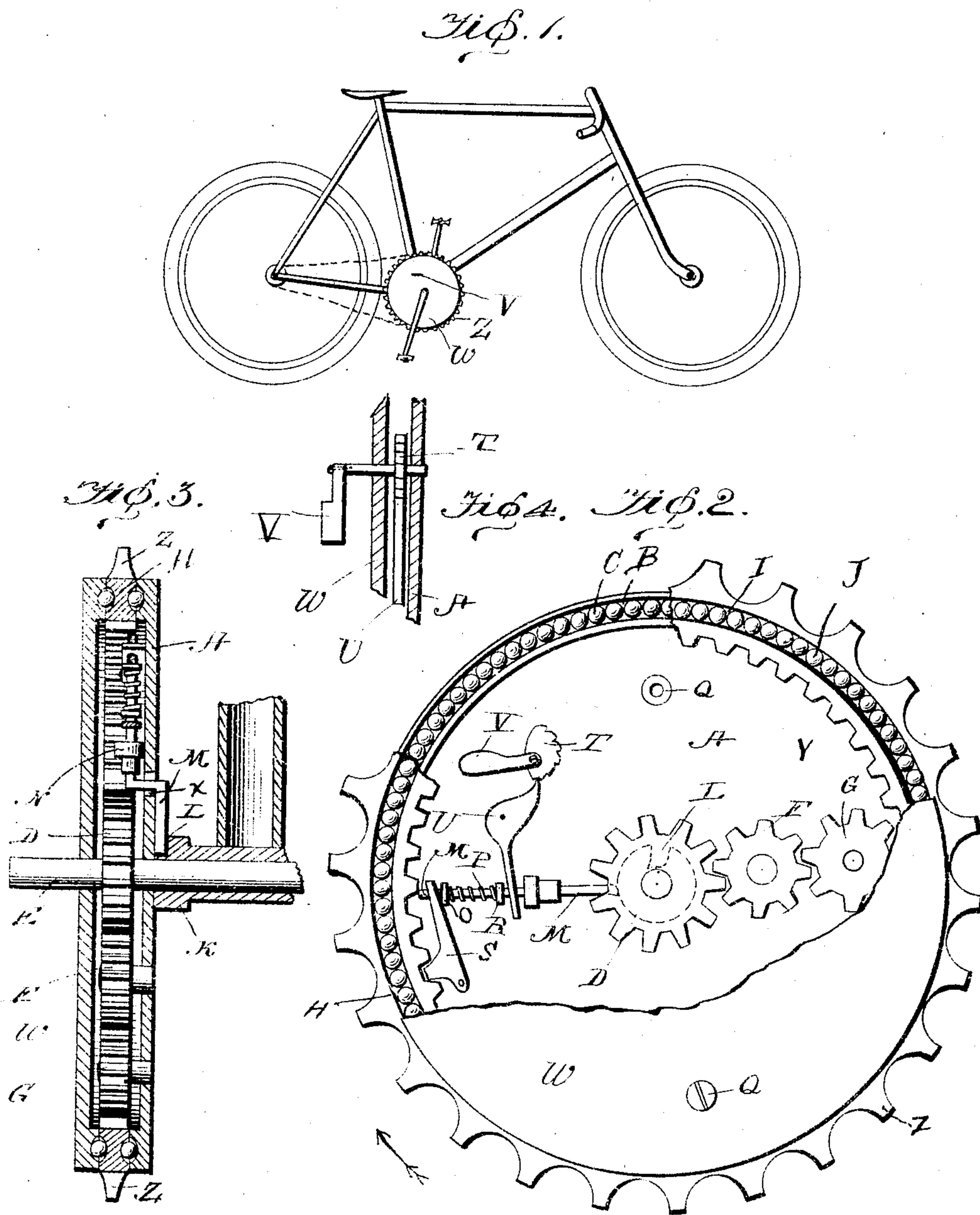
No. 764,908.

PATENTED JULY 12, 1904.

S. M. WIXCEL.
TWO-SPEED GEAR.

APPLICATION FILED FEB. 13, 1901.

NO MODEL.



Witnesses

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UNITED STATES PATENT OFFICE.

SAMUEL M. WIXCEL, OF MARCUS, IOWA.

TWO-SPEED GEAR.

SPECIFICATION forming part of Letters Patent No. 764,908, dated July 12, 1904.

Application filed February 13, 1901. Serial No. 47,126. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL M. WIXCEL, a citizen of the United States, residing in the city of Marcus, in the county of Cherokee and State of Iowa, have invented certain new and useful Improvements in Two-Speed Gears, of which the following is a specification.

This invention relates to improvements in two-speed gears applicable to bicycles and various other machines.

The object of this invention is to provide means by which the speed can be changed while the machine is in motion, either automatically or at the will of the operator.

The mechanism is provided with a tension-spring, which is adjustable by means of a toothed cam, which can be operated while the mechanism is in motion, thus enabling the operator to adjust the tension-spring so that the gear will change automatically at any desired pressure either to a high or low gear. I attain this object by the device illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a bicycle, showing the application of this invention. Fig. 2 is a plan view with parts broken away showing the mechanism. Fig. 3 is a partial sectional view of a bicycle-hanger, showing the two-speed gear attached thereto. Fig. 4 is a detail view of the lever-operating device.

Like letters refer to like parts.

A represents a circular plate or disk having on its perimeter a groove B, in which are adapted to operate the steel balls C, and which plate or disk has a hole in its center adapted to slip over or onto the shaft of the hanger.

D represents a pinion or cog-wheel rigidly attached to the shaft of the hanger, as shown at E in Fig. 3.

F represents a pinion or cog-wheel rotatably attached to the plate or disk A, so that the cogs mesh with the cogs or pinion D.

G represents a pinion or cog-wheel rotatably attached to plate or disk A, so that its cogs mesh with the cogs of pinion F.

H represents a circular rim having on its under side a groove which registers with the groove B in plate or disk A and having on its inside circumference cogs Y, which are adapted to mesh with the cogs on the pinion G, and

having on its outside circumference sprockets Z, adapted to carry an ordinary bicycle chain or belt, and having on its upper side a groove I, in which are adapted to operate the steel balls J.

K represents the hub of the crank-hanger and has in its end and next to plate or disk A a notch or recess L.

M represents a tension-rod slidably attached to the plate or disk A by means of the collar N, which collar is rigidly attached to the plate or disk A, said rod M having one end adapted to engage the notch L and has its other end threaded and adapted to receive the nut O thereon.

P represents a spiral spring surrounding the tension-rod M, one end of which is adapted to press against the nut O and having attached to its other end a collar R, slidably mounted upon the tension-rod M.

S represents a dog or lever pivotally attached at one end, by means of a screw or rivet, to the plate or disk A, its other end loosely engaging the tension-rod M above the bur or nut O and having on one side a projection or tooth adapted to engage the cogs Y on the inside circumference of the rim H.

T represents a toothed cam pivotally attached at a point outside of its center to the plate or disk A and having on its circumference notches or teeth.

U represents a dog or lever pivotally attached at or near its center to the plate or disk A, one end of which is adapted to engage with the teeth or notches on the cam T, the other end slidably encircling the tension-rod M at a point between the collars N and R and serves to regulate the tension of the spring P.

V represents a lever or crank removably attached, by means of a screw or bolt, to the cam T and serves to rotate the cam T, thereby operating the dog or lever U.

W represents a plate or disk of similar size and construction to the plate or disk A and having on its perimeter a groove similar to the groove B and which plate or disk is adapted to cover the mechanism from dust and is attached, by means of screws, to the plate or disk A at the points Q.

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X represents a slot in the plate or disk A and serves the purpose of allowing the tension-rod M to engage the notch L in the hub K.

5 In operation by revolving the pedals in the direction indicated by the arrow in Fig. 2 the projection on the dog S engages with the cogs Y on the inside circumference of the rim H, thereby revolving the whole mechanism and
10 creating the high gear; but when the pressure of the cogs Y upon the projection of the dogs becomes greater than the pressure of the spiral spring P it causes the tension-rod M to engage with the notch L, thereby holding the
15 plates or disks A and W stationary, and causes the pinions D, F, and G to rotate, which causes the rim H to rotate more slowly, thereby creating the low gear, but will change automatically back to the high gear the instant
20 the pressure on the cogs Y becomes less than the pressure of the spiral spring P.

It is evident that slight changes may be made in the form and arrangement of the several parts described without departing
25 from the spirit and scope of my invention, and hence I do not wish to be limited to the exact construction herein set forth; but,

Having described my invention, what I desire to claim as new and secure by Letters
30 Patent is—

1. In a two-speed gear, the combination with a shaft, a gear thereon, a crank-hanger having a notched hub mounted on said shaft, of a disk rotatably mounted on said shaft and
35 having a groove extending around its perimeter, a rim having teeth on its inside circumference and sprocket-teeth upon its outside circumference, another disk upon the opposite side of the rim provided with a groove
40 upon its perimeter, balls mounted in the grooves so as to allow the rim to rotate freely between the disks, gears meshing with the teeth in the rim and the gear on the shaft, and mechanism adapted to engage and disen-
45 gage the notch of the hub and the teeth of the rim, for the purpose set forth.

2. In a two-speed gear, the combination of a shaft, a crank-hanger connected thereto, two disks or circular plates loosely mounted on
50 said shaft, a rim having external sprocket-teeth and internal gear-teeth mounted between the two plates, means for making the rim revoluble with the shaft, a notched hub carried by the crank-hanger, a tension-rod
55 slidably attached to one of said disks and having its outer end threaded and a nut secured thereon, a spiral spring loosely mounted on said tension-rod, means for adjusting said spring to the tension desired, and means to
60 operate said rod to cause the inner end of the rod to engage the notch of the hub.

3. In a two-speed gear, the combination with a shaft and a notched hub surrounding the shaft, of two disks or plates loosely mount-
65 ed on said shaft, a rim having sprocket-teeth

and internal gearing mounted between the plates, means for making the rim revoluble with the shaft, a tension-rod carried by one of the disks and having its outer end in operative engagement with said means and its inner in a position to engage the notch of the hub when the rod is moved inward, a toothed cam pivotally attached to one of said disks, and a lever pivotally attached to the same disk, one end of said lever being adapted to
70 engage the teeth of said cam and the other end loosely engaging the tension-rod.

4. In a two-speed gear, the combination with a notched hub, a driving-shaft journaled therein, a toothed wheel or pinion rigidly secured to said shaft, two disks or circular plates loosely mounted on said shaft, and enclosing said toothed wheel or pinion, each of said disks having a groove extending around the inside of the perimeter, steel balls
80 adapted to operate in each of said grooves, a rim, having teeth or cogs on its inside circumference, rotatably mounted between said steel balls and disks, a dog pivotally attached, at one end, to one of said disks, and having a
90 tooth formed on one of its sides adapted to engage the teeth or cogs on said rim, substantially as described.

5. In a vehicle, a driving mechanism, comprising a driving member, a driven member,
95 internal gearing between said driving and driven members, and means operated by the resistance offered to the speed of the vehicle by the path or road over which it is traveling for controlling said internal gearing to auto-
100 matically increase or decrease the speed of the vehicle as the resistance decreases or increases.

6. A driving mechanism, comprising a shaft, a driving member mounted concentrically with and rigidly upon said shaft, a driven
105 member mounted concentrically with and turning upon said shaft, intermediate gearing between said driving and driven members, and a spring-controlled mechanism opposed to the resistance offered said driving mechanism and automatically controlling said inter-
110 mediate gearing to increase or decrease the relative speed of said driven member as the resistance to said driving mechanism decreases or increases.

7. A driving mechanism, comprising a train of gears having direct and positive driving connection with each other, a spring-controlled mechanism opposed to the resistance offered said driving mechanism operatively
120 connected with the intermediate members of said train and operating to automatically control the same to increase or decrease the speed of the driven member as the resistance to said driving mechanism decreases or increases.

8. A vehicle-driving mechanism, comprising a plurality of cooperating sprockets, internal gearing within one of said sprockets, a chain, and means opposed to the resistance offered by the road over which the vehicle is
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traveling controlling said internal gearing mechanism, whereby the latter operates automatically to increase or decrease the speed of the vehicle as the resistance decreases or increases.

5 9. In a vehicle-driving mechanism, the combination with a driving member and a driven member having fixed relations to each other and forming the terminals of a driving-train, 10 of intermediate transmission members, a spring opposed to the resistance encountered by the driven member automatically rendering functionally movable or immovable one or more of said transmission members, where- 15 by the speed of the driving member is increased or decreased, dependent upon said resistance.

10. A driving mechanism, comprising a

shaft, a driving member mounted concentrically with and rigidly upon said shaft, a driven 20 member mounted concentrically with and turning upon said shaft, intermediate gearing between said driving and driven members, and a spring-controlled cam opposed to the resistance offered said driven member and au- 25 tomatically controlling said intermediate gearing to increase or decrease the relative speed of said driven member as the resistance to said member decreases or increases.

In testimony whereof I have signed my name 30 in the presence of two witnesses.

SAMUEL M. WIXCEL.

Witnesses:

S. W. CHATTERTON,
P. WIXCEL.